

IN THE CLAIMS

1.-22 (Cancelled).

23. (Previously Presented) A method of recovering metals and minerals from sea water, comprising:

contacting a sponge that harbors bacteria capable of concentrating said metal or mineral with sea water, said sponge having a symbiotic relationship with said bacteria, so as to concentrate the metal or mineral in the bacteria; and

recovering the concentrated metal or mineral from the bacteria.

24. (Withdrawn) The method of claim 23, wherein said bacteria is a transgenic bacteria that expresses a heterologous gene that encodes a protein that improves the ability of said bacteria to concentrate said metal or mineral.

25. (Withdrawn) The method of Claim 23, wherein said sponge is a transgenic sponge that expresses at least one heterologous gene that encodes a protein that effects concentration of the metal or mineral in the sponge.

26. (Previously Presented) The method of Claim 23, wherein said symbiotic bacteria is selected from the group consisting of *Bacillus cereus*, *Citrobacter intermedium*, *Acetobacter methanolicus*, *Thermothrix thiopara*, *Phormidium*, *Oscillatoria*, *Mastigocladus*, *Thiobacillus ferrooxidans*, *Thiobacillus*, *Thiooxidans*, *Bacillus licheniformis*, *Bacillus BKPM 4368*, *Pedomicrobium* and *Bacillus subtilis*.

27. (Withdrawn) A method of recovering metals and minerals from sea water, comprising:

contacting a *Cenarchaeum symbiosum* with said sea water; and

recovering concentrated metal or mineral from said *Cenarchaeum symbiosum*, wherein said *Cenarchaeum symbiosum* comprises marine sponge and associated archaea.

28. (Currently Amended) A method of recovering gold from sea water, comprising:
contacting a sponge that harbors bacteria capable of concentrating said gold, said sponge
having a symbiotic relationship with said bacteria, said bacteria being *Pedomicrobium* [with said
sea water]; and
recovering concentrated gold from said sponge.

29. (Currently Amended) A method of recovering metals and minerals from sea water,
comprising:
contacting a sponge that harbors bacteria capable of concentrating said metal or mineral,
said sponge having a symbiotic relationship with said bacteria, said bacteria being *Cyanobacteria*
[with said sea water]; and
recovering concentrated metal or mineral from said sponge.

30. (Withdrawn) A method of recovering metals and minerals from sea water,
comprising:
contacting a sponge with said sea water; and
recovering concentrated metal or mineral from said sponge, wherein symbiotic bacteria
indigenous to said sponge are modified to include bacteria capable of accumulating said metal or
mineral.

31. (Currently Amended) A method of recovering metals and minerals from sea water,
comprising:
cultivating sponges that harbor bacteria capable of concentrating said metal or mineral,
said sponges having a symbiotic relationship with said bacteria in a sponge bed, said bacteria
being capable of accumulating said metal or mineral;
permitting said metal or mineral to accumulate; and
recovering concentrated metal or mineral from said sponges.

32. (Withdrawn) A method of recovering metal and minerals from sea water, comprising:
contacting a transgenic sponge with sea water to concentrate the metal or mineral in the
bacteria, wherein the sponge expresses at least one heterologous gene that encodes a protein that
effects concentration of the metal or mineral in the sponge and wherein the sponge harbors
bacteria capable of concentrating said metal or mineral; and
recovering the concentrated metal or mineral from the sponge.